UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/650,121	08/28/2003	Olvi L. Mangasarian	1061-001US01	5513

28863 7590 11/01/2005

SHUMAKER & SIEFFERT, P. A.
8425 SEASONS PARKWAY
SUITE 105
ST. PAUL, MN 55125

EXAMINER	
TRAN, MAI T	

ART UNIT	PAPER NUMBER
2129	

DATE MAILED: 11/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/650,121	MANGASARIAN ET AL.	
	Examiner	Art Unit	
	Mai T. Tran	2129	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08/28/2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-45* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-45* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This Office Action is responsive to application 10/650121, filed August 28, 2003. Applicants' preliminary amendment dated November 5, 2003 requesting to amend the originally filed specification to refer to Government sponsored rights has been entered. Claims **1-45** are presented for examination.

CLAIM REJECTIONS - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The invention as disclosed in claims **1-45** is directed to non-statutory subject matter.

2. Claims 1-30 are not claimed to be practiced on a computer, therefore, it is clear that the claims are not limited to practice in the technological arts. On that basis alone, they are clearly non-statutory.

3. Regardless of whether any of the claims are in the technological arts, none of them is limited to practical applications in the technological arts. Examiner finds that *In re Warmerdam*, 33 F.3d 1354, 31 USPQ2d 1754 (Fed. Cir. 1994) controls the 35 U.S.C. § 101 issues on that point for reasons made clear by the Federal Circuit in *AT&T Corp. v. Excel Communications, Inc.*, 50 USPQ2d 1447 (Fed. Cir. 1999). Specially, the Federal Circuit held that the act of:

> ...[T]aking several abstract ideas and manipulating them together adds nothing to the basic equation. *AT&T v. Excel* at 1453 quoting *In re Warmerdam*, 33 F.3d 1354, 1360 (Fed. Cir. 1994).

Examiner finds that Applicants' "a linear programming formulation of a support vector machine classifier" references are just such abstract ideas.

4. Examiner bases his position upon guidance provided by the Federal Circuit in *In re Warmerdam*, as interpreted by AT&T v. Excel. This set of precedents is within the same line of cases as the *Alappat-State Street Bank* decisions and is in complete agreement with those decisions. *Warmerdam* is consistent with *State Street's* holding that:

> Today we hold that *the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price*, constitutes a practical application of a mathematical algorithm, formula, or calculation because it produces 'a useful, concrete and tangible result" -- *a final share price momentarily fixed for recording purposes and even accepted and relied upon by regulatory authorities and in subsequent trades*. (emphasis added) *State Street Bank* at 1601.

5. True enough, that case later eliminated the "business method exception" in order to show that business methods were not per se nonstatutory, but the court clearly *did not* go so far as to make business methods *per se statutory*. A plain reading of the excerpt above shows that the Court was *very specific* in its definition of the new *practical application*. It would have been much easier for the court to say that "business methods were per se statutory" than it was to define the practical application in the case as "...the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price..."

6. The court was being very specific.

7. Additionally, the court was also careful to specify that the "useful, concrete and tangible result" it found was "a final share price momentarily fixed for recording purposes and even accepted and relied upon by regulatory authorities and in subsequent trades." (i.e. the trading activity is the further practical use of the real world monetary data beyond the transformation in the computer – i.e., "post-processing activity").

8. Applicants cite no such specific results to define a useful, concrete and tangible result. Neither do Applicants specify the associated practical application with the kind of specificity the Federal Circuit used.

9. Furthermore, in the case *In re Warmerdam*, the Federal Circuit held that:

> ...[T]he dispositive issue for assessing compliance with Section 101 in this case is whether the claim is for a process that goes beyond simply manipulating 'abstract ideas' or 'natural phenomena' ... As the Supreme Court has made clear, '[a]n idea of itself is not patentable, ... *taking several abstract ideas and manipulating them together adds nothing to the basic equation*. In re Warmerdam 31 USPQ2d at 1759 (emphasis added).

10. Since the Federal Circuit held in in *Warmerdam* that this is the "dispositive issue" when it judged the usefulness, concreteness, and tangibility of the claim limitations in that case, Examiner in the present case views this holding as the dispositive issue for determining whether a claim is "useful, concrete, and tangible" in similar cases. Accordingly, the Examiner finds that Applicants manipulated a set of abstract "a linear programming formulation" to solve purely algorithmic problems in the abstract (i.e. what *kind* of "programming formulation" is used? algorithm elements?) Clearly, a claim for manipulation of "linear programming formulation" is provably even more abstract (and thereby less limited in practical application) than pure "mathematical algorithms" which the Supreme Court has held are per se nonstatutory – in fact, it *includes* the expression of nonstatutory mathematical algorithms.

11. Since the claims are not limited to exclude such abstractions, the broadest reasonable interpretation of the claim limitations includes such abstractions. Therefore, the claims are impermissibly abstract under 35 U.S.C. §101 doctrine.

12. Since *Warmerdam* is within the *Alappat-State Street Bank* line of cases, it takes the same view of "useful, concrete, and tangible" the Federal Circuit applied in *State Street Bank.* Therefore, under *State Street Bank*, this could not be a "useful, concrete and tangible result". There is only manipulation of abstract ideas.

13. The Federal Circuit validated the use of *Warmerdam* in its more recent *AT&T Corp. v. Excel Communications, Inc.* decision. The Court reminded us that:

> Finally, **the decision in In re Warmerdam**, 33 F.3d 1354, 31 USPQ2d 1754 (Fed. Cir. 1994) **is not to the contrary**. *** The court found that the claimed process did nothing more than manipulate basic mathematical constructs and concluded that **'taking several abstract ideas and manipulating them together adds nothing to the basic equation'**; hence, the court held that the claims were properly rejected under §101 ... Whether one agrees with the court's conclusion on the facts, the **holding** of the case is a straightforward application of the basic principle that mere laws of nature, natural phenomena, and abstract ideas are not within the categories of inventions or discoveries that may be patented under §101. (emphasis added) AT&T Corp. v. Excel Communications, Inc., 50 USPQ2d 1447, 1453 (Fed. Cir. 1999).

14. Remember that in *In re Warmerdam*, the Court said that this was the dispositive issue to be considered. In the *AT&T* decision cited above, the Court reaffirms that this is the issue for assessing the "useful, concrete, and tangible" nature of a set of claims under 101 doctrine. Accordingly, Examiner views the *Warmerdam* holding as the dispositive issue in this analogous case.

15. The fact that the invention is merely the manipulation of *abstract ideas* is clear. The data referred to by Applicants' phrase "linear programming formulation" is simply an abstract construct that does not limit the claims to the transformation of real world data (such as monetary data or heart rhythm data) by some disclosed process. Consequently, the necessary conclusion under *AT&T, State Street* and *Warmerdam,* is straightforward and clear. The claims take several abstract ideas (i.e., "computing elements" in the abstract)

and manipulate them together adding nothing to the basic equation. Claims 1-45 are, thereby, rejected under 35 U.S.C. §101.

CLAIM REJECTIONS - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims **1-45** are rejected under 35 U.S.C. §112, first paragraph because current case law (and accordingly, the MPEP) require such a rejection if a §101 rejection is given because when Applicant has not in fact disclosed the practical application for the invention, as a matter of law there is no way Applicant could have disclosed *how* to practice the *undisclosed* practical application. This is how the MPEP puts it:

> ("The how to use prong of section 112 **incorporates as a matter of law** the requirement of 35 U.S.C. §101 that the specification disclose as a matter of fact a practical utility for the invention.... If the application fails as a matter of fact to satisfy 35 U.S.C. §101, then the application **also fails as a matter of law** to enable one of ordinary skill in the art to use the invention under 35 U.S.C. §112."); In re Kirk, 376 F.2d 936, 942, 153 USPQ 48, 53 (CCPA 1967) ("Necessarily, compliance with § 112 requires a description of how to use presently useful inventions, **otherwise an applicant would anomalously be required to teach how to use a useless invention**.") See, MPEP 2107.01(IV), quoting In re Kirk (emphasis added).

Therefore, claims 1-45 are rejected on this basis.

CLAIM REJECTIONS - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims **1-45** are rejected under 35 U.S.C. 102(b) as being anticipated by "Finite Newton Method for Lagrangian Support Vector Machine Classification", by Glenn Fung et al, Data Mining Institute Report, 02-01, February 2002, hereafter Fung.

Claim 1

A method comprising:

defining a linear programming formulation of a support vector machine classifier (page 3, paragraph 2, line 9 – the linear and nonlinear kernel classification);

solving an exterior penalty function of a dual of the linear programming formulation to produce a solution to the support vector machine classifier (page 5, equation (10)); and

selecting an input set for the support vector machine classifier based on the solution (page 5, line 25).

Claim 2

The method of claim 1, further comprising minimizing the exterior penalty function for a finite value of a penalty parameter (page 2, line 5).

Claim 3

The method of claim 1, wherein the linear programming formulation is a 1-norm linear programming formulation (page 4, line 1).

Claim 4

The method of claim 1, wherein the solution is a least 2-norm solution (page 4, line 3).

Claim 5

The method of claim 1, wherein the support vector machine classifier is a linear support vector machine classifier, and selecting an input set includes selecting a set of input features of the linear support vector machine classifier (page 3, line 16).

Claim 6

The method of claim 1, wherein the support vector machine classifier is a nonlinear support vector machine classifier, and selecting an input set includes selecting a set of kernel functions for the nonlinear support vector machine classifier (page 5, line 17).

Claim 7

The method of claim 1, further comprising:

calculating a separating surface based on the selected input set and the support vector machine classifier (page 5, line 7); and

classifying data using the separating surface (page 5, lines 7-10).

Claim 8

The method of claim 7, further comprising classifying the data into two sets of data using the separating surface (page 4, Figure 1).

Claim 9

The method of claim 7, wherein the separating surface is one of an n-dimensional hyperplane or a nonlinear surface (page 3, line 12).

Claim 10

The method of claim 1, further comprising applying a Newton-based algorithm to solve the exterior penalty function (page 7, equation (17)).

Claim 11

The method of claim 1, further comprising applying one or more linear constraints to the solution of the exterior penalty function (page 6, line 19).

Claim 12

The method of claim 1, wherein selecting an input set includes selecting a subset of input features from a larger set of input features that is substantially larger than the subset of input features (page 14, paragraph 5).

Claim 13

The method of claim 12, wherein the subset of input features includes less than approximately one percent of the larger set of input features (page 14, paragraph 5).

Claim 14

The method of claim 12, wherein the subset of input features includes less than approximately .1 percent of the larger set of input features (page 14, paragraph 5).

Claim 15

The method of claim 12, wherein the larger set of input features includes more than 20,000 input features, and the subset of input features includes less than ten input features (page 1, abstract).

Claims 16-30, this is a system version of the claimed method discussed above, in claims 1-15, wherein all claimed limitations have also been addressed and cited as set forth above.

Claims 31-45, this is a software version of the claimed method discussed above, in claims 1-15, wherein all claimed limitations have also been addressed and cited as set forth above.

CONCLUSION

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

1. Burges, Christopher John, U. S. Patent No. 6,112,195.

2. Burges, Christopher John, U. S. Patent No. 6,134,344.

3. Oles et al, U. S. Patent No. 6,571,225.

4. Meek et al, U. S. Patent No. 6,728,690.

5. Ewing, Todd J.A., U. S. PGPub. 2003/0115030.

6. Ewing, Todd J.A., U. S. PGPub. 2003/0167135.

7. Fung, Glenn, U. S. PGPub. 2005/0105794.

8. Prakash et al, U. S. PGPub. 2005/0119837.

9. Kilveri et al, U. S. PGPub. 2005/0171923.

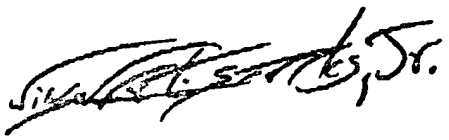
10. "Empirical error based optimizationof SVM kernels: application to digit image recognition", Ayat, N. E., Cheriet, M., Suen, C. Y., Frontiers in Handwriting Recognition, 2002. Proceedings 8th Intl, 6-8 Aug. 2002, pages: 292-297.

CORRESPONDENCE INFORMATION

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mai T. Tran whose telephone number is (571) 272-4238. The examiner can normally be reached on M-F 9:00am-- 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Vincent can be reached on (571) 272-3080. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



M.T.T
Patent Examiner
Date: 10/20/2005

Wilbert L. Starks
Primary Examiner
Tech Center 2100